

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2016/2017

**PSP 0101 – PROBLEM SOLVING AND PROGRAM DESIGN /
PSP 0015 – PROBLEM SOLVING IN PROGRAMMING AND
SYSTEM DESIGN**

(Foundation in Information Technology)

06 MARCH 2017

9.00 a.m – 11.00 a.m

(2 Hours)

INSTRUCTIONS TO STUDENT

1. This question paper consists of **THREE** pages excluding the cover page.
2. Answer **ALL** questions.
3. Write your answers in the Answer Booklet.

Instructions: Answer **ALL** questions. Write your answers in the Answer Booklet.

QUESTION 1 [25 Marks]

- a. "There are 15 cookies to be given equally to 3 kids. How many cookies will each kid get?"

State and apply the six problem solving steps to solve this problem.

(9 marks)

- b. List **FIVE (5)** generations of development of programming languages.

(5 marks)

- c. Write the most suitable data type for the following values.

i. Temperature = 78.9

ii. PhoneNum = "0123456789"

iii. StudentID = "1161001234"

iv. FinalMark = 90

v. Grade = 'B'

vi. PassStatus = True

(6 marks)

- d. Write the following equations in proper computational operators.

i. $3A + 2B = \frac{4B}{2}$

(2.5 marks)

ii. $\frac{A + 3B}{C} = 2B + B^2$

(2.5 marks)

QUESTION 2 [25 Marks]

You are asked to write a program that will calculate the area of a shape selected by a user. The program will first display a list of shape; A – Rectangle, B – Triangle, C – Circle. Then the program will ask the user to enter the alphabet that represents the shape that he/she wants. After the alphabet is entered, the program will ask the user to enter the necessary values needed in order to calculate the area for that shape. For example, to calculate the area of a triangle, the height and the base are needed. Finally, the program will display the area for that particular shape. Sample program is shown in Figure 1 below. Assume all the values entered by the user are valid.

```
A - Rectangle
B - Triangle
C - Circle
Please select the shape: B
Please enter the height: 15
Please enter the base: 3
The area is: 22.5
```

Figure 1

Continued...

- a. Complete the data dictionary below for the above problem. List of items are given. You only need to provide suitable variable names for the items and their data types.

Item	Variable Name	Data Type
The shape ID		
Height of the rectangle		
Width of the rectangle		
Height of the triangle		
Base of the triangle		
Radius of the circle		
The area		

(7 marks)

- b. Draw a flowchart for this program using the variable names from the data dictionary. Use the straight-through logic structure.

(18 marks)

QUESTION 3 [25 Marks]

- a. Aslan wants to create a program that can check whether a triangle is valid or not if a user enters the angles. A triangle is valid when the sum of all angles is 180° . Create an IPO chart for this program.
- b. Draw a flowchart using a While loop structure for a program that asks a user to enter an integer and then prints the number of digit for that integer. For example, when the user enters 345, the program will print 3. When the user enters 63100, the program will print 5.
- c. Admiral Ackbar puts \$300,000 into a bank account that earns 7% interest per year. He wants to know how many years he has to wait for his investment to double from the original amount. Write an algorithm for this program. Use a Repeat-Until loop structure.

(8 marks)

(9 marks)

(8 marks)

Continued...

QUESTION 4 [25 Marks]

- a. You have been asked to write a program to record 10 respondents' votes on who are their most favourite character in The Walking Dead TV series. After all the respondents have keyed in their favourite character's name, the program will ask a user to enter the character name and the total number of votes for that character will be displayed. Refer to the sample output given in Figure 2 below. Write a complete algorithm for this program using an Automatic-Counter loop for the array structure.

```
Name: Glenn
Name: Rick
Name: Rick
Name: Daryl
Name: Carol
Name: Maggie
Name: Rick
Name: Rick
Name: Glenn
Name: Michonne
10 votes have been entered
Searching for? Rick
Rick has 4 votes
```

Figure 2

(12 marks)

- b. Draw a complete flowchart based on module (function) for a program that will ask a user to enter the value in Ringgit Malaysia, convert the Ringgit Malaysia value to Yen and then display the Yen value. Hint: 100 Yen = RM3.90

(13 marks)